Some Observations on the Herpetofauna of the Macquarie Marshes Region, NSW, with Special Reference to Chelidae

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INTRODUCTION

The Macquarie Marshes, in central western New South Wales, represent one of the most important inland wetlands in that State (Pratten 1982) and according to Paijmans (1981) are still in a semi-natural state and harbour a great variety of plants and waterbirds. However, there has been a recent shift from the traditional sheep and cattle grazing land use in this area to agriculture and a consequent need to monitor the affects of this change on the native flora and fauna.

While there is some basic information available on its vegetation (e.g. Paijmans 1981) and birds (e.g. Cooper 1954), there are no published data on its herpetofuana.

This paper documents recent field observations by us on the frogs, turtles, lizards and snakes in the Macquarie Marshes and surrounding country. Relevant specimens housed in the Australian National Wildlife Collection, Canberra and the Australian Museum, Sydney have been examined. An eye disease of *Chelodina longicollis* is described and the results of a mark-recapture experiment with this species are presented. It is hoped that this contribution will facilitate the consideration of this often neglected group of vertebrates in future plans of management for the Marshes.

The core of the Marshes forms a wetland area of **c.** 40 000 ha of which the major habitats are river red gum forests and woodlands, reed beds, water couch grassland, mixed marsh and lagoons. These and other vegetation types have been mapped by Paijmans (1981).

METHODS

Through June 1977 to January 1981, the survey team (1-3 persons) visited the area for **c.** 4 days at approximately monthly intervals. This period included a very wet year (1978) and a very dry year (1980). During each trip a census of vertebrates, especially waterbirds, was conducted in the wetland habitats using aerial, boat and ground transect counts. Observations on frogs and reptiles other than turtles were made opportunistically during the course of this work. On 10 occasions, roads in the area were spotlighted at night.

More detailed observations were made on members of the Chelidae especially *Chelodina longicollis*. All turtles were counted on boat transects which traversed **c.** 35 km of the major streams in the Marshes. Most available wetland types were recorded by this method. Observations usually started after 0800 hours and finished by 1600 hours. Any turtle caught during the course of this field work was marked using the technique of Vestjens (1978) but our own numbering system. Most of these animals were found sun-basking or were removed from fish-traps. During the period December 1979 to January 1981 we systematically searched a **c.** 50 m section of bank under willow trees *(Salix babylonica)* in a section of the Macquarie River known as 'The Willows' (30°46'S, 147°31'E). The actual zone of roots searched varied according to the

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height of the stream and on each occasion one observer searched for about one hour in the early afternoon. All animals released were marked and allocated to three size classes according to the length of the carapace: small (<10 cm), medium (10-20 cm) and large (>20 cm).

Varanus varius numbers were included in all routine counts and the colour morph was noted.

Nomenclature follows Cogger *et al.* (1983).

RESULTS

(a) Turtles

We found three species of turtles in the survey area. In addition, Jim Stopford (pers. comm.) claims a record of *Elseya* affin *latisternum* in this section of the Macquarie River.

Emydura macquarii (Gray) was found only in permanent channels. Most of our observations were on animals caught in fish traps. In the Marshes, it was rarely seen basking whereas this species was a regular basker at Armidale, NSW according to Parmenter (1976). Its abundance appeared to be intermediate between those of *Chelodina expansa* and *C. longicollis.*

Chelodina expansa 'Gray'. Three individuals were recorded in channels and lagoons from Old Oxley to the northern Macquarie Marshes. The low number of observations may not reflect their abundance here as they are known to be thoroughly aquatic and quite secretive (Legler 1978).

Chelodina longicollis (Shaw). This species was abundant in all wet areas. A total of 132 turtles were recorded during boat transects; 92% during October-April inclusive with no records in May or June. At least one animal was observed in each of the major habitats but over 50% were seen on a 4.2 km section where the channel ran through dense reedbeds *(Phragmites australis).*

Nearly all *C. longicollis* were basking on the bank or on partly-submerged logs when first seen. This behaviour contrasts sharply with that reported by Parmenter (1976) at Armidale, NSW, where this species did not bask.

A nest (possibly of this species) with 10 eggs was found 22 October, 1980. A hatchling was seen 18 September, 1979.

Sixty-one turtles were marked and released during routine work in the Marshes. A further 416 animals were caught at 'The Willows'. Of these, 412 *C. longicollis* were marked and released (Table 1) and 31 were recaptured at the same site (five recaptured twice) up to 12 months after marking. One animal was found by Paul Webber (pers. comm.) 6.5 km north-east of the release point 15 months after marking. The number captured peaked in January; the low numbers caught in winter and early spring corresponded with the period when the willow trees were leafless.

These data (Table 1) do not allow a meaningful estimate of the size of the population. It would appear that the animals here were very mobile and/or there were a large number present.

The size structure of the *C. longicollis* caught at 'The Willows' was small:medium:large = 1:2:1 (n = 415). There was a significant excess in the proportion of small turtles captured in February 1980 ($P<0.01$) and March 1980 ($P<0.05$). The ratio in retraps (9:13:9) was not significantly different ($P>0.05$) from the whole sample.

Table 1. Number of *C. longicollis* captured at 'The Willows', Macquarie Marshes.

			Number recaptured										
Year	**Month**	**No. marked**	**Jan 80**	**Feb 80**	**Mar 80**	**May 80**	**June 80**	**July 80**	**Sept 80**	**Oct 80**	**Nov 80**	**Dec 80**	**Jan 81**	**Total indiv.**
1979	**Dec**	**43**	**2**	•	•	•	•	•	**1**	**1**	•	**1**	•	**5**
	Jan	**77**	—	**8^{xyz}**	•	**2^{x}**	•	•	**1**	**3^{yzo}**	**1°**	•	**3**	**14**
	Feb	**40**	—	—	**3**	•	•	•	**1**	**1**	•	•	•	**5**
	Mar	**27**	—	—	—	•	•	•	**1**	•	•	•	**2**	**3**
	May	**24**	—	—	—	—	**1**	•	•	•	**1+**	•	**1+**	**2**
1980	**June**	**8**	—	—	—	—	—	•	•	•	•	•	•	**0**
	July	**6**	—	—	—	—	—	—	•	•	•	•	•	**0**
	Sept	**18**	—	—	—	—	—	—	—	•	•	•	•	**0**
	Oct	**29**	—	—	—	—	—	—	—	—	•	•	•	**0**
	Nov	**30**	—	—	—	—	—	—	—	—	—	•	**1**	**1**
	Dec	**40**	—	—	—	—	—	—	—	—	—	—	**1**	**1**
1981	**Jan**	**70**	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL		**412**	**2**	**8**	**3**	**2**	**1**	**0**	**4**	**5**	**2**	**1**	**8**	**31**

x, y, z, o and + were recaptured twice.

In July 1979, two *C. longicollis* were observed with an eye condition that appeared to blind the animal (see Fig. 1). The whole eye area was inflamed, greatly enlarged and bled if bumped. A further five infected animals were seen during 1980 (one in each of the following months: January, Febraury, April, July and August). All these turtles showed the advanced stage of the condition. Most of 1979 and all of 1980 were dry periods with a low flow in the Macquarie River.

There is no published record of this condition from Australia or in any free-living *Chelodina* (T. Bergin pers. comm.). Its symptoms appear clinically similar to a disease of the Harderian gland described by Reichenbach-Klinke and Elkan (1965) and a condition called Hypovitaminosis A by Wallach (1978). One affected animal was taken to Canberra and administered Cod Liver Oil for eight weeks but did not recover. This treatment is recommended by Wallach (1978) for cases of Hypovitaminosis A.

(b) Frogs, Lizards and Snakes

A systematic list of species of frogs, lizards and snakes is given in the Appendix. The species of *Uperoleia* is unclear (see Tyler *et al.* 1981). The records of *Lophognathus gilberti* represent an extension of range. However, as the taxonomy of this group of Agamidae is under review, a new species may be involved. Three of the nineteen *Pseudonaja textilis* recorded were the melanic form (Fig. 2).

Varanus varius was found throughout the area but was most closely associated with wooded channels. Thirty-nine of 100 observations were of the banded form. Most records (53%) were made during summer (December-February) with only one winter (June-August) sighting. A large *V. varius* was seen chasing a pair of Brushtailed Possums *(Trichosurus vulpecula)* for an hour in a clump of Red Gums in the northern Marshes. The possums escaped by jumping from the top branches to the ground then climbing another tree.

A further two species of wetland lizards not recorded by us probably occur in this region. Mr H. Ehmann (pers. comm.) saw two animals believed to be *Sphenomorphus quoyii* beside the Macquarie River near The Mole in October 1980. A specimen of *Physignathus lesueurii* (Museum of Victoria No. D10602) was collected from the Macquarie River at Gin Gin, (**c.** 35 km upstream of Warren) in January 1964 by John Coventry.

Specimens collected during this survey are lodged in the Australian National Wildlife Collection, Division of Wildlife and Rangelands Research, CSIRO, Canberra, A.C.T.

DISCUSSION

Three species of turtles, 12 frogs, 27 lizards and 13 snakes were recorded in the Macquarie Marshes and surrounding country. Of these, only the turtles and one species of frog *Ranidella parinsignifera* appear to rely solely on the permanent wetlands. The turtle, *Chelodina longicollis* may be a suitable study animal for monitoring changes in water regimes and the effect of pesticides as it is numerous, easy to catch and there is more background information on it than on the other two species. We found *Varanus varius, Hemiaspis damelii* and *Pseudechis porphyriacus* to be closely associated with wetland margins. Any alterations by clearing or stream diversion of these habitats would be expected to effect the distribution and abundance of these three species in the Marshes.

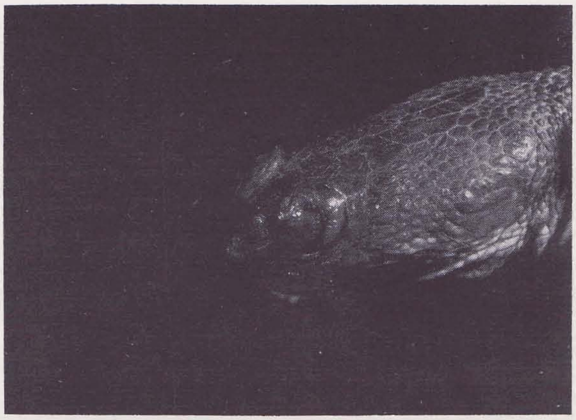

Fig. 1. An adult Eastern long-necked turtle *Chelodina longicollis* found July 1980 with an advanced stage of the eye condition.

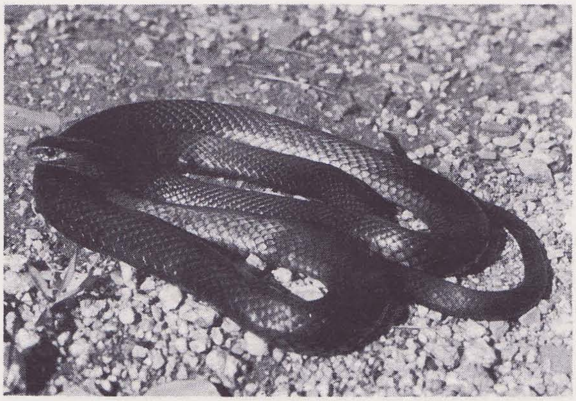

Fig. 2. The Melanic form of the Eastern Brown Snake *Pseudonaja textilis*.

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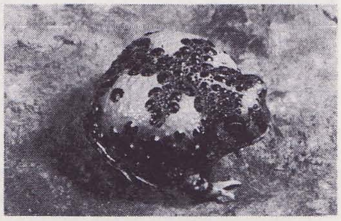
APPENDIX

Systematic list of frogs, lizards and snakes found in the Macquarie Marshes region, 1977-1981. (Habitat where seen: W = wetlands, D = dry country, WD = both).

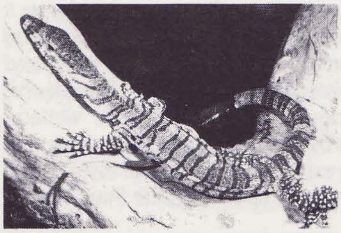
FROGS



Notaden bennetti.
Photo by J. C. Wombey.

Ranidella parinsignifera (Main)	W
Cyclorana platycephala (Günther)	D
Limnodynastes fletcheri Boulenger	WD
L. salmini Steindachner	WD
Neobatrachus sudelli (Lamb)	D
Notaden bennettii Günther	D
Uperoleia sp. (Gray) vel aff.	D
Litoria alboguttata (Günther)	D
L. caerulea (White)	WD
L. latopalmata Günther	D
L. peronii (Tschudi)	WD
L. rubella (Gray)	WD

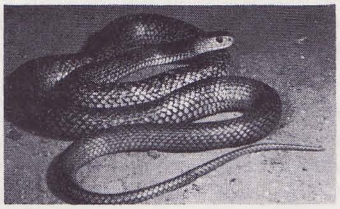
LIZARDS



Varanus varius.
Photo by J. C. Wombey.

Diplodactylus intermedius Ogilby	D
D. tessellatus (Günther)	D
Gehyra australis Gray	WD
G. variegata (Dumeril and Bibron)	WD
Heteronotia binoei (Gray)	D
Oedura marmorata Gray	D
Delma inornata Kluge	WD
Lialis burtonis Gray	WD
Pygopus nigriceps (Fischer)	D
Amphibolurus barbatus (Cuvier)	WD
A. nobbi Witten	WD
Lophognathus affin *gilberti* (Gray)	WD
Tympanocryptis tetraporophora Lucas and Frost	D
Varanus gouldii (Gray)	D
V. tristis (Schelegel)	WD
V. varius (Shaw)	WD
Cryptoblepharus carnabyi Storr	WD
Ctenotus robustus Storr	D
C. allotropis Storr	D
C. ingrami Czechura and Wombey	D
Egernia striolata (Peters)	WD
Lerista muelleri (Fischer)	D
L. punctatovittata (Günther)	D
Menetia greyi Gray	D
Morethia boulengeri (Ogilby)	WD
Tiliqua scincoides (Shaw)	WD
Trachydosaurus rugosus Gray	D

SNAKES



Pseudonaja textilis.
Photo by J. C. Wombey.

Ramphotyphlops bituberculata (Peters)	D
Morelia spilotes (Lacepede)	WD
Denisonia devisii Waite and Longman	WD
Furina diadema (Schlegel)	D
Hemiaspis damelii (Günther)	WD
Pseudechis australis (Gray)	D
P. guttatus De Vis	D
P. porphyriacus (Shaw)	WD
Pseudonaja textilis (Dumeril, Bibron and Dumeril	WD
Simoselaps australis (Krefft)	D
Suta suta (Peters)	D
Unechis dwyeri (Worrell)	D
Vermicella annulata (Gray)	D